

## 5.?? Conservation Measure Studies and Surveys

Numerous studies have been proposed as conservation measures which would be implemented as part of CMARP and/or the ERP. The studies and surveys are primarily designed to determine species ecological requirements, restoration needs, abundance and distribution, or the effects which program actions may have upon the species. The studies listed as Conservation Measures are not the complete list of species-related studies CALFED intends to undertake; the CMARP also lists numerous studies, primarily for fish, which would be taken to obtain greater understanding of species recovery requirements.

Not all studies listed in the MSCS will need to be accomplished to restore the species. For some species, studies proposed in the MSCS would be needed prior to or at least concurrent with restoration actions designed to benefit the species; the studies are required to determine recovery requirements for the species. However, in other instances, it is fairly safe to assume that ERP restoration actions should provide anticipated benefits to the species; species-specific studies on recovery would be necessary only if restoration actions failed to improve the species status and distribution as expected. Thus, the studies necessary for restoration may be viewed as priorities for implementation as compared to other studies which would be implemented on a conditional basis.

To provide an increased level of certainty for understanding which of these Conservation measure studies are priority actions, CALFED has proposed a two-category classification of the Conservation Measure studies and surveys. The categories and their respective Conservation Measures are listed below.

### Draft Conservation Strategy Research Measures

#### 1. Priority research projects needed to understand species needs and status prior to attempting recovery actions.

**Soft Bird's-Beak (R)** Research the habitat requirements and reasons for rarity of the variety. Determine microhabitat requirements and salinity and other habitat management needs.

**Suisun Thistle (R)** Research the habitat requirements and reasons for rarity of the variety. Determine microhabitat requirements and salinity and other habitat management needs. Design and implement habitat enhancement and management measures.

**Suisun Thistle (R)** Study vulnerability to hybridization with non-native *Cirsium* species, and design and implement non-native *Cirsium* control measures, when hybridization is likely to occur.

**Suisun Thistle (R)** Study vulnerability to agents for biological control of non-native thistles, and design and implement actions to reduce the effects of biological control agents when biological control effects are likely.

**Riparian Brush Rabbit (r)** Develop and implement an emergency plan and monitoring system to provide swift action to save individuals and habitat at Caswell Memorial State Park in the event of flooding, wildfire, or a disease epidemic.

**San Joaquin Valley Woodrat (r)** Conduct surveys to map suitable species habitat and locate woodrat populations along

portions of the San Joaquin River and its major tributaries within the species' historic range.

**Giant Garter Snake (r)** Conduct surveys to locate species populations and determine distribution in the Delta Region to assist in identifying additional appropriate actions that should be implemented to assist in recovering Delta populations.

**Giant Garter Snake (r)** Research the feasibility of reintroducing the giant garter snake into suitable unoccupied existing and restored habitats in the Delta, Sacramento River, and San Joaquin River Regions.

**Giant Garter Snake (r)** Conduct research to better determine ecological requirements of the giant garter snake.

**Delta Green Ground Beetle (r)** Survey suitable habitat, including large pools associated with pascadero soils, to establish the current boundary of the species range.

**Delta Green Ground Beetle (r)** Conduct research to develop a greater understanding of the species' life history, including larval requirements and prey species ecology (especially springtail). Use results to develop habitat requirements and management prescriptions to promote and ensure population viability.

**Delta Green Ground Beetle (r)** Conduct research to identify appropriate methods for reintroducing individuals to establish new populations within the species historic range in suitable existing or restored habitat areas.

**Alkali Milkvetch (r)** Conduct surveys to locate additional populations of alkali milkvetch.

## 2. Conditionally-required research projects which would be implemented if restoration efforts do not succeed in restoring the species.

**Suisun Ornate Shrew (R)** Conduct research to better determine the ecological requirements of the Suisun ornate shrew for use in designing and managing restored and enhanced habitat areas to benefit the species.

**Valley Elderberry Longhorn Beetle (R)** Conduct research to determine the distance over which the species can disperse from occupied habitat areas to suitable unoccupied habitat areas.

**Delta Smelt (R)** Conduct research to determine appropriate methods for rearing delta smelt in captivity and evaluate the need to acquire rearing facilities in the event delta smelt populations continue to decline following implementation of restoration actions.

**Lange's Metalmark (R)** Conduct research to identify appropriate methods for propagating the Lange's metalmark butterfly's host plant, a subspecies of the naked buckwheat (*Eriogonum nudum* var. *auriculatum*), and establish the plant populations in enhanced and restored habitat.

**Antioch Dunes Evening-Primrose (R)** Conduct research to identify appropriate methods for propagating these and establish species populations in enhanced and restored habitat.

**Green Sturgeon (R)** Conduct research to determine harvest levels in the Delta.

**Green Sturgeon (R)** Conduct research to determine how to manage operations at the Red Bluff diversion dam to improve flows for the green sturgeon.

**Central Valley Fall-Run Chinook Salmon (R)** Conduct research to identify methods for censusing populations and to determine the distribution of spawning fish in Central Valley streams.

**Mason's Lilaeopsis (R)** Conduct research into the extent and physical and biological qualities of existing habitat and populations prior to levee or restoration actions

**Salt Marsh Harvest Mouse (r)** Conduct research to better determine the ecological requirements of the salt marsh harvest mouse for use in designing and managing restored and enhanced habitat areas to benefit the species.

**Salt Marsh Harvest Mouse (r)** Conduct research to identify feasible methods for controlling invasive non-native marsh plants and reintroducing SMHM into unoccupied suitable enhanced habitats and restored habitat areas.

**San Pablo California Vole (r)** Conduct research to identify feasible methods for controlling invasive non-native marsh plants and reintroducing San Pablo California voles into unoccupied suitable enhanced habitats and restored habitat areas.

**Northern California Black Walnut (r)** Conduct research into values provided by walnut stands to determine the role of northern California black walnut in the ecosystem.

**Northern California Black Walnut (r)** Research species ecology (e.g., dispersal mechanisms) to formulate restoration, protection and management strategies for contributing to recovery.

**Bristly Sedge (r)** Research habitat requirements and potential conservation measures. Design and implement conservation measures based on results of research.

**Delta Coyote-Thistle (r)** Research the species' ecology to formulate strategies for recovery.

**Alkali Milkvetch (r)** Research reintroduction techniques and apply the results to reintroduction of populations to portions of the historic range where the plant is extirpated.

**Riparian Brush Rabbit (r)** Conduct research to identify appropriate methods for implementing a captive breeding program; capturing and handling individuals from wild populations; and reintroducing individuals to establish new populations within its historic range in suitable existing or restored habitat areas.

**San Joaquin Valley Woodrat (r)** Conduct research to identify appropriate methods for implementing a captive breeding program; capturing and handling individuals from wild populations; and reintroducing individuals to establish new populations within its historic range in suitable existing or restored habitat areas.

**Sacramento Perch (r)** Conduct research to determine appropriate methods for rearing Sacramento perch in captivity and evaluate the need to acquire rearing facilities to provide fish for introductions or in the event Sacramento perch populations continue to decline following implementation of restoration actions.

**Sacramento Perch (r)** Conduct research to determine methods for reestablishing populations in habitats not populated by non-native predators and to identify suitable locations for establishing additional populations.

**Delta Mudwort (r)** Research the extent and physical and biological qualities of existing habitat and populations prior to levee or restoration actions.